Crop Production News

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CROPS AGRICULTURE

EDITOR'S COMMENTS

by Sean Miller, PAg
Provincial Specialist, Plant Disease

Insects and crop diseases get our focus throughout the summer and leading into harvest. The Crop Protection Laboratory has been busy of late with samples of these pests, as well as samples showing other types of injury. If you discover a pest that you cannot identify, you can submit a sample to the Crop Production Laboratory. For information on how to submit a sample to the lab, go to Saskatchewan Agriculture's website at: www.agriculture.gov.sk.ca/Crop_Protection_Lab.

Our insect pest and disease surveys are underway. Volunteers are needed to arrange and conduct soil sampling for clubroot testing as part of the canola disease survey. Please contact Sean Miller at sean.miller@gov.sk.ca or 306-787-4670 for more information. The Bertha Armyworm Monitoring Program is underway and counts are coming in. The first map of the season will soon be available. If you are a Bertha armyworm trap cooperator, please remember to forward your land locations and weekly counts to Brian Olson at brian.olson@gov.sk.ca or 1-888-323-7842.

For an update on provincial crop progress throughout the growing season, see the weekly Crop Report at www.agriculture.gov.sk.ca/Crop-Report or on Twitter at @SKGovAg.

Crop Production News is a bi-weekly publication prepared primarily by provincial specialists with the Crops and Irrigation and Regional Services branches of the Saskatchewan Ministry of Agriculture. It is a compilation of articles related to entomology, plant pathology, weed science, soils and agronomy issues.

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THIS ISSUE

Government of Saskatchewan
Ministry of Agriculture

CROP PROTECTION LAB UPDATE

by Celicia Peluola, PAg
Supervisor

There were many samples of diseases and other crop disorders submitted in the last two weeks of June. The majority of the samples were root rot of various crop including pea, lentil, durum and common wheat and barley. Many other samples had herbicide injuries due to improper application timing or use, herbicide drift and inadequate tank cleaning between applications. This resulted in many symptoms of herbicide injury such as leaf blight, leaf banding, yellowing, purpling, cupping, stunting and the proliferation of branches.

Herbicide injury on pea.
Photo courtesy of Saskatchewan Agriculture.

Important diseases/disorders:

Stem smut of wheat grass – *Ustilago hypolytes*

Leaf spot of sour cherry – *Coccomyces hiemalis*

Root rot of lentil – *Pythium* and *Fusarium* sp.

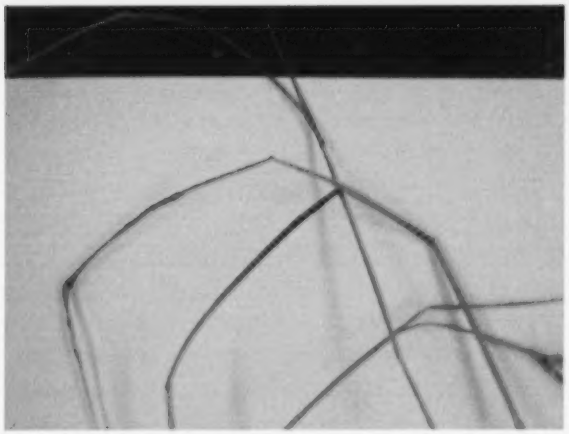
Common root rot of durum/ wheat – *Cochliobolus sativus*

Root and ascochyta foot rot of pea – *Fusarium* sp, *Rhizoctonia solani*, *Phoma medicaginis*

Root rot and bulb decay of garlic – *Fusarium* and *Penicilium* sp.

Chemical and environmental damage was also diagnosed on canola, wheat and peas.

Insect: Black fly (family *Simulidae*), leaf beetle (family *Chrysomelidae*) and carpenter ants (family *Formicidae*, *Campomotus* species) were diagnosed in the last two weeks.



Stem smut on wheat grass.
Photo courtesy of Saskatchewan Agriculture.

CHECK OUT POORLY PERFORMING PATCHES IN FIELDS

by Ken Panchuk, PAg
Provincial Specialist, Soils

While crop scouting, poorly performing patches within a field may be noticed. If this is an issue, then a tool known as the "complete comparative tissue plus soil test" can be very useful to determine if a nutrient deficiency is the cause of each significant patch within a field. The comparative tissue plus soil test involves collecting a representative tissue sample from the affected area and also from a nearby healthy site within the same field. Also, representative soil samples (15 cores per composite sample) are collected from the affected area and a nearby healthy area of the field. Each of the plant tissue and soil samples is collected carefully to avoid contamination. Contact your lab for proper sampling procedures.

The lab analysis looks at macronutrients and micronutrients as well as at soil characteristics such as pH and salinity levels. The patch of crop that is performing poorly may be due to nutrient(s) deficiency or a soil problem, such as salinity. Or it could turn out to be another problem unrelated to the soil or nutrients.

If the identified nutrient deficiency is a mobile macronutrient (nitrogen and/or sulphur) or a micronutrient, then in-crop corrective action can be taken by applying an appropriate amount of a plant-available form of that nutrient as soon as possible. Follow label directions when applying micronutrients. It is always a good idea to leave an untreated check strip to see if the corrective action was effective and economical. Nutrients added at full- to late-flowering or heading stage will not likely result in much improvement in yield or quality. The process will, however, provide valuable information for the next crops in the rotation, so keep good records including GPS coordinates so that these patches can be addressed early for the next crop cycle.

INOCULANTS FOR FORAGE LEGUMES UNAVAILABLE IN CANADA

by Kevin France, PAg
ProvincialSpecialist, Forage Crops

Inoculants for sainfoin, cicer milkvetch, birdsfoot trefoil, red, white or alsike clover remain commercially unavailable in Canada this year. This has been an issue for the past couple years and it appears there is no near-term solution. Some clay-based inoculants have not met Canadian Food Inspection Agency (CFIA) standards and have been deregistered for use, while other companies are no longer producing their CFIA-registered products. The CFIA, Canadian seed companies and industry are talking about solutions, but demand for forage legumes with inoculant will be the driver.

Producers planning to seed any of these legumes this fall will have to do so without inoculant. This should not be a problem if the legumes are seeded into land that had previously grown inoculated legumes; however, producers seeding the legumes into land that has not grown inoculated legumes should expect a lower yield. The actual yield reduction will vary from field to field and will be dependent upon native bacteria in the soil.

Legume producers are hopeful they will see the return of legume inoculants in the near future, but until then, there will be uncertainty associated with the decision to seed forage legumes.

FUNGICIDE APPLICATION TIMING

by Sean Miller, PAg
Provincial Specialist, Plant Disease
and
Rory Cranston, PAg
Regional Crops Specialist

Saskatchewan producers are becoming more aware, knowledgeable and active when it comes to controlling diseases in their crops. However, one difficulty most producers still face is properly timing a fungicide application to get the optimum level of control.

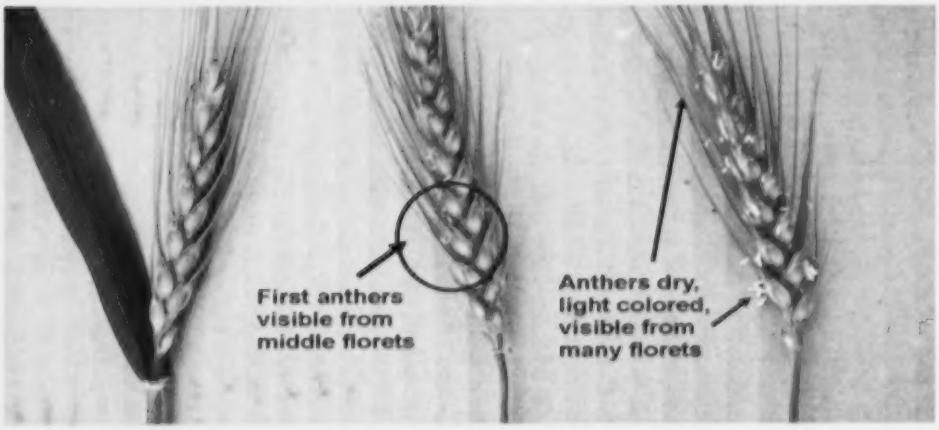
Timing is critical, as most fungicides will only prevent disease development on a plant, not cure it. Apply a fungicide too late and disease will already be established in your crop; apply too early and the fungicide's effectiveness can end while there is still significant risk of disease.

Determining the best time to spray can be difficult. Proper staging can be elusive, given unpredictable weather conditions. For example, a hot summer in Saskatchewan can cause a crop to develop extremely fast, with the optimum stage passing in less than a day. The variations in Saskatchewan climate from year to year affect development enough to make it impossible to have a fixed date for fungicide application. Furthermore, weather conditions can eliminate the need for a fungicide application if they are not favourable to disease development.

Fungicide timing for Fusarium Head Blight

In the 2012 growing season, there were numerous inquiries about the proper time for a fungicide application to control Fusarium Head Blight (FHB) in wheat. If weather conditions are favourable to disease development, the proper time to apply is from when 75 per cent of the wheat heads are fully emerged to when 50 per cent of the heads on the main stems have visible anthers (see photo on next page). These stages usually occur near the middle of July, and will last three days at most. The current recommended wheat seeding rate of 1.6 bushels per

FHB Application Timing on Wheat



Early, Not yet flowering | Correct timing, Early flowering | Late, After pollination

acre encourages tillering, which will increase the variation of flowering and increase difficulty when staging the crop. Increasing seeding rates will reduce tillering and flowering variation, making it easier to stage.

Fungicide timing for leaf diseases

The flag leaf is responsible for filling wheat kernels. Lesions or pustules on this leaf will reduce the photosynthetic area and affect kernel weight and yield. If conditions are favourable to disease development and early symptoms are observed, protect the flag leaf with a foliar-applied fungicide before leaf spot and rust diseases progress.

Normally, cereal rusts, like leaf and stripe rust, will appear later in the season in Saskatchewan, arriving on wind currents from the Pacific Northwest region of the United States. If rusts appear late (dough stage or later), they are unlikely to cause economic losses. However, if the rusts arrive earlier, or even overwinter here like they did in 2011, they can nibble away at yields for a longer period of time and create the need for fungicides.

Similarly to the leaf spots, the focus of scouting for cereal rusts should be the flag leaf. However, because rusts can attack the kernels as well as leaf tissue, and there is a greater potential for yield damage, the window for spraying may be slightly wider than the flag leaf-targeted application required for good control of leaf spots. At the jointing-to-boot stage, spraying is warranted if there is rust on at least five per cent of plants (incidence) with at least three per cent of flag leaf tissue affected (severity). At the heading-to-flowering stage, spray if there is at least 10 per cent rust incidence and five per cent severity. At the milk stage, and only if the fungicide's post-harvest interval (PHI) allows, spray if there is at least 20 per cent rust incidence and 10 per cent severity. If no pustules are observed, spraying is not necessary. If rust is too severe to control (80 per cent incidence and 70 per cent severity), spraying is not recommended.

Remember, timing is extremely important, but the economic benefit of a fungicide application will also depend on the price of grain, the yield loss if the disease is left uncontrolled and the cost of the fungicide, including application.

Fungicide timing for sclerotinia

Sclerotinia levels in Saskatchewan are dependant on moisture, and the disease is worse and more widespread during wet years. Consider soil moisture, weather conditions, crop stage and density and disease history when deciding whether to apply a fungicide to control this disease. Properly timing a fungicide application is critical and, much like FHB, it is too late to apply fungicide when the symptoms are observed. Scout for conditions conducive to sclerotinia before early flowering. Fungicides should be applied to canola, flax and mustard between the 20- to 50-per-cent flower stages to protect the petals from being colonized by the spores and dropping onto the rest of the plant below.

For lentils, chickpeas and field peas, fungicides should be applied at the beginning of flowering before the canopy closes. Additional fungicide applications for sclerotinia control can be made with some products. Always check the label of the

fungicide you are using and do not exceed the maximum number of applications per season.

WEED CONTROL IN IRRIGATED BEAN CROPS

by Garth Weiterman, PAg
Manager, Agronomy Services
and
Dale Risula, PAg
Provincial Specialist, Special Crops

To maximize dry bean production, weed control is critical. Most dry beans are grown using row crop equipment on 22 inch spacing (some wider at 30 inches). The usual practice is to use pre-emergent and in-crop herbicide applications to control weeds. Cultivating the soil early supplements weed control, aerates the soil, and prepares the field for the undercutting harvest operation.

In-row cultivation is generally practiced using a two-pass system. The first cultivation occurs after the post-emergent herbicide is applied and target weeds are dying and beginning to dry down. This first pass starts the hill formation, kills and or buries weed seedlings, and aerates the plants. "S" tine cultivators with small sweeps or single-shank cultivators are commonly used. Most growers also have a narrow ripper drawn about six inches deep in the row centre. "Dammer dikers" can also be used following the ripper to assist with water infiltration.

The second pass will generally occur a week to 10 days later but definitely before the rows fill in. Late cultivation causes excessive root pruning that stresses the plants and decreases yield. The hilling operation is completed during this pass, generally using special hilling shovels. The ripper will also be lowered another two inches. Ripping has been shown to significantly increase yields. With these cultivations, growers are attempting to form a conical ridge at the base of the plants. This is to ease undercutting as well as prevent collection of water and flower petals at the base of the plant, which can facilitate the development of sclerotinia.

Beans under irrigation near Outlook. Photo courtesy of Saskatchewan Agriculture.

Bean plants that are partially covered by soil during these operations are greatly delayed in maturity. Different types of shields, rolling or stationary, are used to prevent burying the plants. This also allows for faster operating speeds.

The increase in irrigated acres in Saskatchewan presents a great opportunity to increase bean production. Compared to lentils, peas, chickpeas and fababeans, beans are the most-consumed pulse crop in the world.

FLAX CROP TOUR, JULY 25 IN INDIAN HEAD

by Venkata Vakulabharanam, PAg
Provincial Specialist, Oilseed Crops

Over the last two years, flax has seen a resurgence in its popularity with Saskatchewan farmers. Optimal flax yields can only be achieved by adopting best management practices. SaskFlax and the Indian Head Agriculture Research Farm (IHARF) are providing a great opportunity for growers and agrologists to learn about new flax cultivars and best management practices at their Flax Crop Tour on July 25, 2013, at the research farm.

SaskFlax and IHARF have joined forces to present four flax crop production demonstrations.

1. Optimal Fertilizer Management for Flax Production will examine:
   - response of flax to applications of varying rates of nitrogen, phosphorus and sulphur;
   - implications of placement on flax emergence; and
   - potential merits of split nitrogen applications.

Fertilizer is one of the largest input costs. Flax responds well to nitrogen fertilizer, but less

consistently to phosphorus fertilizer. This is because farmers, as one of their strategies for maintaining soil fertility, often apply at least enough phosphorus to replace what the crop removes. The demonstration will also educate producers on potential toxicity issues with seed-placed fertilizer.

2. Seeding Rate and Seeding Date Effects on Flax Establishment and Yield will demonstrate:
   - effects of low, medium and high seeding rates at early and late seeding dates on flax establishment and yield.

For optimal flax yields, a minimum plant population of 300 plants per square metre is generally recommended. This demonstration will showcase the potential benefits of using higher seeding rates, particularly when seeding into cold soil. The project will also help redefine beneficial management practices for flax.

3. Relative Performance of Current and Upcoming Flax Varieties will demonstrate:
   - relative performance of current and soon-to-be commercially available flax varieties.

Flax.
Photo courtesy of Saskatchewan Agriculture.

Currently, there are many flax varieties registered. This demonstration will allow current and potential flax growers an opportunity to compare varieties in a field environment, and to gather more information on re-constituted seed.

4. Broadleaf Herbicide and Foliar Fungicide Options for Flax will showcase:
   - currently registered flax herbicide and fungicide options and provide a forum for discussion on the advantages and disadvantages of the different products.

While there are relatively few herbicide options available for flax, all have a distinct mode of action and vary in their ability to control specific spectrums of weeds. With respect to foliar fungicide, only Headline EC is registered for control of pasmo disease. This project will demonstrate if application of Headline EC increases yields and also allow producers to compare the effectiveness of selected herbicides.

These projects are supported by the Agricultural Demonstration of Practices and Technologies (ADOPT) initiative under the Canada-Saskatchewan Growing Forward 2 bilateral agreement. FMC Canada Ltd. also provided financial support for the demonstration trial: "Broadleaf herbicide and Foliar Fungicides Options for Flax".

Mark your calendar to attend the Flax Crop Tour at Indian Head on July 25. Registration and refreshments begin at 9 a.m. To pre-register or get more information, visit www.saskflax.com or www.iharf.ca.

INSECT UPDATE

by Scott Hartley, PAg
Insect/Vertebrate Pest Management Specialist

Reports of **alfalfa weevil** infestations and extensive feeding have continued in the past two weeks. Over the past few years, alfalfa weevil populations have been on the rise and they now occur in most regions in Saskatchewan. In 2013, alfalfa weevil infestations have been reported from the Assiniboia area south of Moose Jaw to east of Saskatoon/Colonsay. Insecticide application is usually not economic in forage alfalfa. In alfalfa hay production, damage can be minimized without a chemical application by making an earlier first cut. Keep in mind that scouting is important to determine weevil numbers. Timing the first cut based on flowering percentage may be misleading. There have been situations in which weevil feeding has reduced the number of florets, making the crop appear less advanced than

it was. If alfalfa weevils persist in high numbers in the new growth, insecticide application may be required. See Crop Production News #2 for more information on the alfalfa weevil.

The **cabbage seedpod weevil** has been a major insect pest in canola in 2013. The most severe infestations have been reported in the southwest; however, economic levels of the cabbage seedpod weevil have been reported in the south-central region.

The recommended crop stage to begin cabbage seedpod weevil control ranges from 10 to 20 per cent flowering. The upper part of this range is the best time for control since weevils will be moving out of overwintering locations and it is better to wait to ensure that the weevils have entered the field. In addition, early feeding on canola plants and flowers is not generally considered significant. The serious damage begins when the female weevils lay eggs in the early developing pods. Spraying for the weevil too early can result in having to make a second application of insecticide to control new infestations from continued migration and re-invasion. If an application of fungicide for sclerotinia is being considered, a combined fungicide/insecticide tank mix would reduce application time and labour.

Insecticides registered for cabbage seedpod weevil are in the synthetic pyrethroid class of chemistry and work best at temperatures below 25 C. Avoid applying these insecticides during the heat of the day. Evening applications will also have a less negative impact on beneficial insects visiting the crop, including both parasites of pest insects and plant pollinators. Keep in mind that pollinators can increase yield even in hybrid canola.

For more information, refer to the cabbage seed pod weevil alert issued by the Canola Council of Canada.

Wheat midge emergence has been delayed due to the cooler spring of 2013. In most years, wheat midge begin to emerge in parts of southern Saskatchewan in the last week of June. However, this year as of late June, only southern Alberta and the Red River Valley south of Winnipeg had reached sufficient heat units for the adult midge flies to emerge. It is likely that, with the increased heat during the first week of July, wheat midge will start to emerge in areas of Saskatchewan this week. Excessive moisture will lower soil temperatures and can delay wheat midge emergence.

Weekly updates on insect issues and climatic information across the Prairies are posted by the Prairie Pest Monitoring Group on the Western Forum website. Also included is a base 5 degree day map estimating the level of wheat midge emergence produced by Agriculture and Agri-Food Canada, Saskatoon.

Pheromone trap counts for **bertha armyworm** moths have greatly increased during the first week in July. The expected peak emergence is usually around mid-July. Bertha armyworm maps will be posted on the Saskatchewan Agriculture website throughout the season. The intention of the trap monitoring and map is to provide a warning of potential high risk from the destructive larvae that will appear later in July and August.

Uncharacteristically high numbers of **grasshoppers** have been reported in the northeastern (Whitefox, Nipawin) region of the province. Grasshoppers are usually most problematic in southern, drier regions. Cool, wet climatic conditions are not favourable to grasshoppers. Humid conditions favour potentially fatal fungal diseases in grasshoppers. Younger grasshoppers are easier to control and require lower insecticide rates. Ideally, control should occur when the majority of the grasshopper population is in the third instar (about one half inch) stage. At this stage, they are more mobile and more capable of consuming significant amounts of plant material

For information on insecticide options for specific crops and economic thresholds, refer to the 2013 Guide to Crop Protection.

CROP QUESTIONS OF THE WEEK

by Brent Flaten, PAg, CCA
Integrated Pest Management Specialist

During the past week, the Agriculture Knowledge Centre has been receiving calls regarding late in-crop weed control, fungicide timing on pulses, canola and cereals, and controlling insects such as

alfalfa weevils, cabbage seedpod weevils and wheat midge (which are discussed in other articles in this edition).

Two common questions that are not addressed elsewhere are 1) proper cleaning of sprayers and 2) root rot in peas.

There have been reports of herbicide left in sprayer tanks, booms or filters damaging subsequently sprayed crops. This underlines the importance of following proper sprayer cleanout procedures, which will vary depending on the product. Refer to individual product labels and to pages 15 and 16 of the 2013 Guide to Crop Protection for proper procedures.

Triple-rinsing with water is not enough to remove some herbicides' residue from sprayers. Flushing the sprayer thoroughly with ammonia and/or detergent may be necessary. It is important to clean out the booms and any filters in addition to the spray tank. Many people assume that of herbicide residue injury to subsequent crops occurs during the first few passes over the next susceptible crop. This isn't always true. For example, Group 2 herbicides can be trapped on sprayer tank walls or booms by petroleum-based formulations and adjuvants until something strips both layers off. Therefore, with Group 2 herbicides, it is recommended to flush the sprayer with detergent mixed with ammonia to clean out the residue. If proper sprayer cleanout procedures are not followed, the Group 2 residue may stay in the sprayer for several susceptible fields until a herbicide and adjuvant is used that strips both layers off, resulting in crop injury.

Another issue is peas turning yellow and dying. This may involve root rot and saturated soils. For peas and lentils, saturated soil can be just as deadly as flooded soil with standing water…it's just a slower death. Most plants can only tolerate 36 to 48 hours under flooded conditions. Crop tolerance of water-logged conditions varies but is generally three to seven days. Root rot is often associated with these conditions, but it is usually a case of root rot infecting plants that were already under stress from excess water in the soil. Another interesting point is that side slopes of the field can be just as affected as the lower slopes. Below is a relative crop tolerance rating to excess water:

- Cereal crops: oats > wheat > barley
- Oilseed crops: canola > sunflower > flax
- Pulse crops: fababeans > soybeans > peas > lentils

Root rot can also occur in dry, unsaturated soil. To check, carefully dig up some plants with the roots intact and look for the symptoms of root rot: brownish spindly roots (see photo). Yellowing accelerates when hot weather starts to dry down the dying plants. This past week has been a "do or die" time, when the plants have either recovered or continued to die off. If a crop continues to yellow and the root rot is severe, it is highly questionable whether any fungicide application would be economical.

Yellowing peas with root rot. Photo courtesy of Saskatchewan Agriculture.

The Crop Production News is a publication of the Crops and Irrigation Branch, Saskatchewan Ministry of Agriculture

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